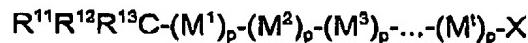
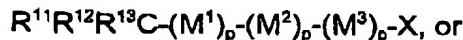
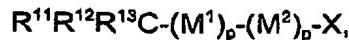


EXHIBIT A

11 64. A (co)polymer, exhibiting a stereochemistry and microstructure, as defined by tacticity and sequence distribution, of a polymer formed by a free radical polymerization process and displaying a molecular weight distribution of less than 2.0 and calculable number average molecular weight, having the formula:



wherein X is selected from the group consisting of Cl, Br, I, OR¹⁰, SR¹⁴, SeR¹⁴, O-N(R¹⁴)₂, S-C(=S)N(R¹⁴)₂, H, OH, N₃, NH₂, COOH and CONH₂ and groups that can be formed therefrom by conventional chemical processes, where

R¹⁰ is an alkyl of from 1 to 20 carbon atoms in which each of the hydrogen atoms may be independently replaced by halide, R¹⁴ is aryl or a straight or branched C₁-C₂₀ alkyl group, and where an N(R¹⁴)₂ group is present, the two R¹⁴ groups may be joined to form a 5- or 6-membered heterocyclic ring,

R¹¹, R¹² and R¹³ are each independently selected from the group consisting of H, halogen, C₁-C₂₀ alkyl, C₃-C₈ cycloalkyl, C(=Y)R⁵, C(=Y)NR⁶R⁷, COCl, OH, CN, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl oxiranyl, glycidyl, aryl, heterocyclyl, aralkyl, aralkenyl, C₁-C₆ alkyl in which from 1 to all of the hydrogen atoms are replaced with halogen and C₁-C₆ alkyl substituted with from 1 to 3 substituents selected from the group consisting of C₁-C₄ alkoxy, aryl, heterocyclyl, C(=Y)R⁵, C(=Y)NR⁶R⁷, oxiranyl and glycidyl,

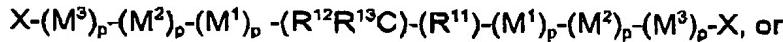
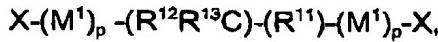
where Y is NR⁸, S or O;

where R⁵ is an aryl or an alkyl of from 1 to 20 carbon atoms, alkoxy of from 1 to 20 carbon atoms, aryloxy or heterocyclyloxy; and R⁶ and R⁷ are independently H or alkyl

of from 1 to 20 carbon atoms, or R⁶ and R⁷ may be joined together to form an alkylene group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring, such that no more than two of R¹¹, R¹² and R¹³ are H, and R⁸ is H, a straight or branched C₁-C₂₀ alkyl or aryl, and

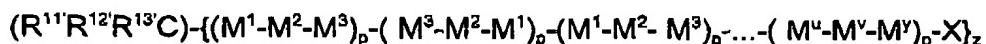
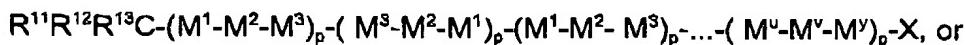
M¹, M², M³,... up to M^t are each monomer units derived from radically (co)polymerizable monomer selected such that the monomers units in adjacent blocks are not identical, and t is an integer greater than 3; p for each block is independently selected such that the number average molecular weight of each block is up to 250,000 g/mol;

the following formulas:



wherein R¹¹, R¹², R¹³, X, M¹, M², M³,... up to M^t, t, and p are as defined above, with the proviso that R¹¹ has a polymer chain as indicated attached thereto;

of the formulas:

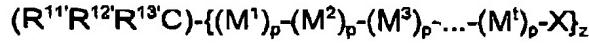
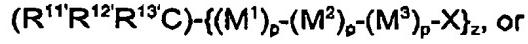
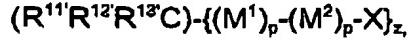
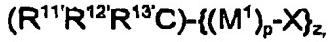


wherein z is from 2 to 6, R¹¹, R¹², R¹³ and X are as defined above, and where R^{11'}, R^{12'} and R^{13'} are the same as R¹¹, R¹² and R¹³ with the proviso that R^{11'}, R^{12'} and R^{13'} combined have from 1 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in brackets attached thereto,

M¹, M² and M³ are monomer units derived from different radically-(co)polymerizable monomers, and M⁴ is one of M¹ or M² or M³ and M⁵ is another of M¹ or M² or M³, and M⁶ is the third (co)monomer,

p for each block is independently selected such that the number average molecular weight of the copolymer is up to 1,000,000 g/mol; and,

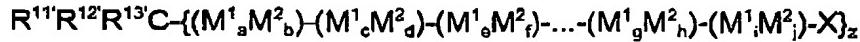
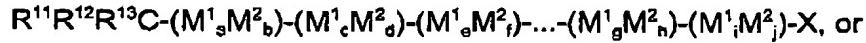
(co)polymers of this topology comprising four or more comonomers, and of the formulas:



wherein z is from 3 to 6; R^{11'}, R^{12'} and R^{13'} are the same as R¹¹, R¹² and R¹³ with the proviso that R^{11'}, R^{12'} and R^{13'} combined contain from 2 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto, where X is as defined above;

M¹, M², M³, ... M^t, p, and t are as defined above; and

and copolymers comprising a block or graft with the above composition; and of the formula:

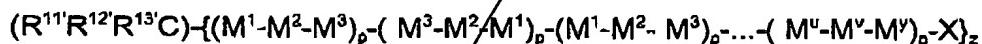
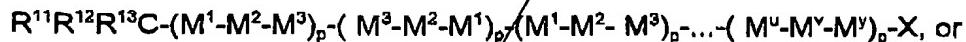
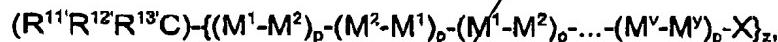


where z is from 2 to 6, R¹¹, R¹², R¹³ are as defined above, M¹ and M² are as defined above and where R^{11'}, R^{12'} and R^{13'} are the same as R¹¹, R¹² and R¹³ with the proviso that R^{11'}, R^{12'} and R^{13'} combined have from 1 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto, and

a, b, c, d, e, f,... up to i and j are non-negative numbers independently selected such that
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a + b = c + d = 100, and any or all of (e + f), (g + h) and (i + j) = 100 or 0, wherein the a:b ratio is from 100:0 to 0:100, the c:d ratio is from 95:5 to 5:95, such that c < a and d > b, and where applicable, the e:f ratio is from 90:10 to 10:90, such that e < c and f > d, and the endpoints of the molar ratio ranges of first monomer to second monomer in successive blocks progressively decrease or increase by 5 such that the e:f ratio is from 5:95 to 95:5, such that e ≠ c and f ≠ d, and the i:j ratio is from 0:100 to 100:0, such that i ≠ e and j ≠ f.

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65. (Amended) The (co)polymer of Claim 64, having a formula:



wherein z is 2 to 6;

wherein R¹¹, R¹², R¹³ and X are as previously defined, and where R^{11'}, R^{12'} and R^{13'} are the same as R¹¹, R¹² and R¹³, with the proviso that R^{11'}, R^{12'} and R^{13'} combined have from 1 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in brackets attached thereto;

M¹, M² and M³ are monomer units derived from different radically-polymerizable or copolymerizable monomers, and M^u is one of M¹, M² or M³ and M^y is another of M¹, M² or M³, and M^v is the third (co)monomer.

p for each block is independently selected such that the number average molecular weight of the copolymer is from 1,000 to 1,000,000 g/mol; and (co)polymers of this topology comprising four or more comonomers

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66. The (co)polymer of Claim 64, having a formula:

$$(R^{11'}R^{12'}R^{13'}C)-\{(M^1)_p-X\}_z,$$

$$(R^{11'}R^{12'}R^{13'}C)-\{(M^1)_p-(M^2)_p-X\}_z,$$

$$(R^{11'}R^{12'}R^{13'}C)-\{(M^1)_p-(M^2)_p-(M^3)_p-X\}_z, \text{ or}$$

$$(R^{11'}R^{12'}R^{13'}C)-\{(M^1)_p-(M^2)_p-(M^3)_p-\dots-(M^t)_p-X\}_z$$

where $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11} , R^{12} and R^{13} as previously defined, with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined contain from 2 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in brackets attached thereto, where X is as defined above;

M^1 , M^2 , M^3 , M^t , p and t are as defined above,

z is from 3 to 6, and copolymers comprising a block or graft with the above composition.

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67. The (co)polymer of Claim 64, having the formulae:

$$R^{11}R^{12}R^{13}C-(M^1_aM^2_b)-(M^1_cM^2_d)-(M^1_eM^2_f)-\dots-(M^1_gM^2_h)-(M^1_iM^2_j)-X, \text{ or}$$

$$(R^{11'}R^{12'}R^{13'}C)-\{(M^1_aM^2_b)-(M^1_cM^2_d)-(M^1_eM^2_f)-\dots-(M^1_gM^2_h)-(M^1_iM^2_j)-X\}_z$$

where R^{11} , R^{12} , R^{13} , and X are as previously defined, and where $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11} , R^{12} and R^{13} with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined have from 1 to 5 of the polymer chains enclosed in square brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto,

M^1 and M^2 are monomer units derived from different radically (co)polymerizable monomers, and a, b, c, d, e, f, ..., up to i and j are non-negative numbers independently selected such that $a + b = c + d = 100$, and any or all of $(e + f)$, $(g + h)$ and $(i + j) = 100$ or 0, wherein the

a:b ratio is from 100:0 to 0:100, the c:d ratio is from 95:5 to 5:95, such that c < a and d > b, and where e ≠ 0 and f ≠ 0, the e:f ratio is from 90:10 to 10:90, such that e < c and f > d, and the endpoints of the molar ratio ranges of first monomer to second monomer in successive blocks progressively decrease or increase by 5 such that the e:f ratio is from 5:95 to 95:5, such that e ≠ c and f ≠ d, and the i:j ratio is from 0:100 to 100:0, such that i ≠ e and j ≠ f, and z is from 2 to 6.